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(71) Applicant: **Dario, Pietro** trading under the  
trading style: **Metanova di Dario Pietro e**  
**Maurilio & C. S.n.c.**  
**Via San Pio X, 40**  
**I-31020 San Vendemiano (Trevise)(IT)**

Applicant: **Dario, Maurilio** trading under the  
trading style: **Metanova di Dario Pietro e**  
**Maurilio & C. S.n.c.**  
**Via San Pio X, 40**  
**I-31020 San Vendemiano (Trevise)(IT)**

(72) Inventor: **Pattaro, Arnaldo**  
**Via Vecchia Trevigiana 133/A**  
**I-31015 Conegliano(IT)**

(74) Representative: **Modiano, Guido et al**  
**MODIANO, JOSIF, PISANTY & STAUB**  
**Modiano & Associati Via Meravigli, 16**  
**I-20123 Milano(IT)**

(54) **Steam Iron.**

(57) The steam iron (2) has a button (4) for activating an electric valve (5) for delivering steam generated by a separate boiler (8) which has a pressure switch (10) and thermostats (11). A refillable water tank (12) is connected to at least one pump (17) which is connected to the boiler (8) by means of a non-return and/or self-triggering valve. A temperature sensor

(23) and/or a sensor for detecting the weight of the boiler is provided for activating the pump (17). According to one aspect of the invention the boiler has at least one level switch. This device allows to provide a low-capacity boiler and at the same time allows the continuous and constant delivery of steam.

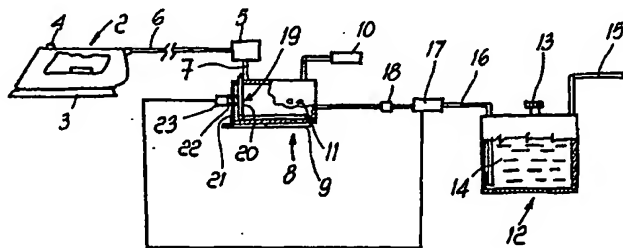


Fig. 1

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## STEAM IRON

The present invention relates to a steam iron.

Ironing can currently be performed with steam irons which can have an internal boiler or a separate boiler which may be pressurized or not.

In the first case, said boiler, besides having resistors for heating the water and thermostats with automatic or manual resetting, comprise a safety plug, a pressure switch and an electric valve together with a duct for conveying the steam to the iron.

Said irons allow to deliver steam upon the activation of a preset button associated with said iron, and said steam can flow out instantaneously, abundantly and with a pressurized jet.

The disadvantage of said known irons consists of the fact that once the water of the boiler is depleted it is necessary to suspend ironing and wait several minutes before opening the plug for access to the tank arranged inside the iron.

It is then also necessary to wait for some time so that the water can be heated to the required temperature.

It can thus be observed that said known irons have a limited endurance which cannot be immediately restored, though they have an excellent production of steam in large amounts and under pressure upon the activation of said button.

In the case of irons having a separate boiler there is a water tank which is connected, by means of a pump, to an instantaneous steam generator which uses an adapted resistor.

The steam generator has thermostats with manual or automatic resetting as well as a duct for conveying the steam to the iron.

Said irons having a separate boiler constituted by an instantaneous steam generator have the advantage of having a practically unlimited steam endurance, since the tank can be refilled continuously, but other disadvantages also arise: when the pump control is activated, steam is obtained with a certain delay (after several seconds), and less pressure and less abundance of steam are obtained with respect to the previously described method.

The aim of the present invention is therefore to eliminate the disadvantages described above in known irons by providing a steam iron having a boiler which is separate from the iron itself and allows the immediate delivery of steam in large amounts and under pressure upon the activation of a control arranged on the iron.

Within the scope of this aim, another important object is to provide a steam iron which can have practically unlimited endurance, without compelling the user to perform continuous refilling operations

and assiduous checks of the water level in a boiler.

Another important object is to provide a steam iron which associates with the preceding characteristics that of allowing the use of a boiler with low capacity.

Another object is to provide a steam iron which allows an energy saving.

A not least object is to provide a steam iron which associates with the preceding characteristics that of being reliable and safe in use and of having modest costs.

According to one aspect of the invention, this aim, these objects and others which will become apparent hereinafter are achieved by a steam iron which has a button for activating an electric valve for delivering steam generated by a separate boiler provided with a pressure switch and thermostats, as well as a refillable water tank connected to at least one pump, connected to said boiler by means of a valve, characterized in that it comprises means for actuating said pump, said means being constituted by a temperature sensor and/or by a sensor for detecting the weight of said boiler.

According to another aspect of the invention, this aim, these objects and others which will become apparent hereinafter are achieved by a steam iron provided with a button for actuating an electric valve for the delivery of steam generated by a separate boiler provided with a pressure switch and with thermostats, characterized in that it comprises at least one refillable separate water tank connected to at least one pump, which is connected to said boiler by means of a non-return and/or self-triggering valve, said boiler having at least one level switch.

Further characteristics and advantages of the invention will become apparent from the detailed description of two preferred embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a schematic view of the components of the steam iron, illustrating the means for actuating the pump constituted by a temperature sensor;

figure 2 is a view of the structure, illustrating the means for actuating the pump constituted by a sensor for detecting the weight of the boiler;

figure 3 is a schematic view of the components of the device according to a second embodiment of the invention.

The term "steam iron" is used in the following description to refer to an iron of the type having a separate steam generator connected thereto.

With reference to figures 1 and 2, the steam iron indicated by the reference numeral 2 is pro-

vided with a plate 3 and with a button 4 for activating an electric valve 5 connected to the iron 2 by means of an adapted first duct 6.

The electric valve 5 allows to deliver steam by being connected, by means of a second duct 7, to a boiler 8 which is separate and remote from the iron 2 itself.

A first resistor 9 is externally associated with the boiler 8 and has a pressure switch 10 and thermostats 11 with manual and automatic resetting.

The structure 1 is furthermore constituted by at least one tank 12, which is distinct from the boiler 8 and from the iron 2 and can be refilled by means of an adapted removable plug 13; water 14 can be introduced therein by means of a third duct 15 connected to a water supply, e.g. the water mains.

The tank 12 is connected to the boiler 8 by means of a fourth duct 16 on which a pump 17 and a non-return and/or self-triggering valve 18 are interposed.

The boiler 8 is furthermore internally provided with at least one second resistor 19 which has an L-shaped configuration, with a wing 20 adjacent to a lateral wall 21 of the boiler 8; the height of said wing 20 is approximately equal to that of the lateral wall 21.

At least one heat transducer 22 for a thermostat 23 arranged outside the lateral wall 21 is present inside said lateral wall at a preset height.

When the water level drops below a preset value, the heat emitted by the exposed wing 20 of the second resistor 19 is transmitted to the thermostat 23 through the heat transducer 22; the thermostat 23 thus closes, activating the pump 17.

When the water exceeds the preset level, the heat transducer 22 cools, and this causes the thermostat 23 to open, blocking the pump 17.

Every time the user acts on the button 4 of the iron 2, the electric valve 5 is activated for the introduction of steam from the boiler 8, said steam being obtained as a consequence of the introduction of the water 14 in said boiler by means of the pressure pump 17.

The water 14 is always available by virtue of the presence of the plug 13 or of the possible third duct 15.

It has thus been observed that the invention has achieved the intended aim and objects, a steam iron having been provided which allows to iron and to immediately deliver steam upon the activation of the button arranged on the iron, said steam flowing out in large amounts and under pressure.

The presence of the manually or automatically refillable separate and distinct tank allows unlimited endurance in steam generation by virtue of the fact that an always optimum water level is maintained in

the boiler 8, which can even have considerably small dimensions.

The steam iron according to the invention also allows to iron optimally without having to waste time for carrying out continuous refilling operations and for waiting while the water reaches the appropriate temperature.

The invention is susceptible to numerous modifications and variations, without thereby departing from the scope of the same inventive concept.

Thus, for example, in the above-described embodiment the first resistor 9 may be omitted and its functions may be performed by the second resistor 19.

In figure 2, the means suitable for actuating the pump 17 are constituted by a sensor for detecting the weight of the boiler 8; said sensor is in turn constituted by one or more springs 24 suitable for supporting said boiler 8 and by a microswitch 25 which activates the pump 17 every time the weight of the boiler 8 drops below a set value.

In fact, when the water level drops below a certain set value, and therefore when the weight of the boiler decreases below a certain value, the microswitch 25 enables the pump 17, which by reintroducing water in the boiler increases its weight until the microswitch is deactivated.

This solution indifferently assumes the use of an internal or external resistor for the boiler 8.

With reference to figure 3, the steam iron, generally indicated by the reference numeral 200 has a plate 300 and a button 400 for actuating an electric valve 500 which is connected to the iron 200 by means of an adapted first duct 600.

The electric valve 500 allows the delivery of steam and is connected, by means of a second duct 700, to a boiler 800 which is separate and remote from the iron 200.

The boiler 800 is constituted by a resistor 900 and has a pressure switch 100 as well as thermostats 110 with manual and automatic resetting.

The device 100 is furthermore constituted by at least one tank 120, which is distinct from the boiler 800 and from the iron 200 and can be refilled by means of an adapted removable plug 130; the water 140 can be introduced therein by means of a third duct 150 which is connected to the water mains.

The tank 120 is connected to the boiler 800 by means of an adapted fourth duct 160 on which a pump 170 and a non-return and/or self-triggering valve 180 are interposed.

The boiler 800 furthermore has at least one level switch 190 which activates the actuation of the pump 170 and the opening of the third duct 150 if provided, if the water inside the boiler 800 drops below a certain level.

The use of the device is therefore as follows:

every time the user acts on the button 400 of the iron 200, the electric valve 500 is enabled for the introduction of steam from the boiler 800, said steam being obtained as a consequence of the introduction of the water 140 in said boiler by means of the pressure pump 170.

Said pump is actuated by the level switch 190 whenever necessary.

The water 140 is always available by virtue of the presence of the plug 130 or of the possible third duct 150.

It has thus been observed that the invention has achieved the intended aim and objects, a device having been obtained which allows to iron and to immediately deliver steam upon the activation of the button arranged on the iron, the steam flowing out in a large amount and under pressure.

The presence of the separate and distinct tank, which can be refilled manually or automatically, allows to have unlimited endurance in steam generation while at the same time it is possible to adopt a boiler 800 with considerably small dimensions.

It is thus possible to optimally configure the resistor 900, furthermore containing energy expenditures, in view of the smaller amount of water to be treated.

The device finally allows to iron optimally, without having to waste time in continuous refilling operations and in waiting for the water to reach the appropriate temperature.

The materials and the dimensions which constitute the individual components of the device may naturally be the most suitable according to the specific requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

## Claims

1. Steam iron comprising a button for activating an electric valve for delivering steam generated by a separate boiler provided with a pressure switch and with thermostats, as well as by a distinct refillable water tank connected to at least one pump which is connected to said boiler by means of a non-return and/or self-triggering valve, characterized in that it comprises means suitable for activating said at least one pump, said means being constituted by a temperature sensor and/or by a sensor for detecting the weight of said boiler.
2. Steam iron according to claim 1, comprising a first duct for connection between said electric valve and said iron and a second duct for connecting said electric valve to said boiler with which a first resistor is possibly externally associated, characterized in that at least one second resistor is arranged inside said boiler, said second resistor being L-shaped with one wing adjacent to a lateral wall of said boiler, at least one heat transducer for a thermostat arranged outside said boiler being associated with said boiler.
3. Steam iron according to claims 1 and 2, characterized in that said thermostat controls the actuation of said pump as a consequence of the lowering of the level of the water contained in said boiler below a preset value, by virtue of the heat sensed by said heat transducer, said thermostat disabling said pump when said preset water level value is reached.
4. Steam iron according to claims 1 and 3, characterized in that said sensor for detecting the weight of said boiler is constituted by one or more springs which are suitable for supporting said boiler and by a microswitch which activates said pump every time the weight of said boiler drops below a presettable value.
5. Steam iron, comprising a button for actuating an electric valve for the delivery of steam generated by a separate boiler which has a pressure switch and thermostats, characterized in that it comprises at least one distinct refillable water tank connected to at least one pump which is connected to said boiler by means of a non-return and/or self-triggering valve, said boiler having at least one level switch suitable for actuating said at least one pump.
6. Steam iron according to claim 5, comprising a first duct for connection between said electric valve and said iron and a second duct for the connection of said electric valve to said boiler, characterized in that said at least one distinct tank, which has a presettable capacity, has a removable plug.
7. Steam iron according to claim 5, comprising a first duct and a second duct for the connection of said electric valve to said iron and to said boiler, characterized in that said tank has a third duct which is connected to a water supply, with the interposition of a possible means suitable for allowing adjustment of the flow of water.

8. Steam iron according to claim 7, characterized in that a fourth duct is present between said tank and said boiler, a pressure pump and a non-return and/or self-triggering valve being interposed at said fourth duct.

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9. Steam iron according to claim 5, characterized in that said boiler has at least one level switch which controls the actuation of said pressure pump.

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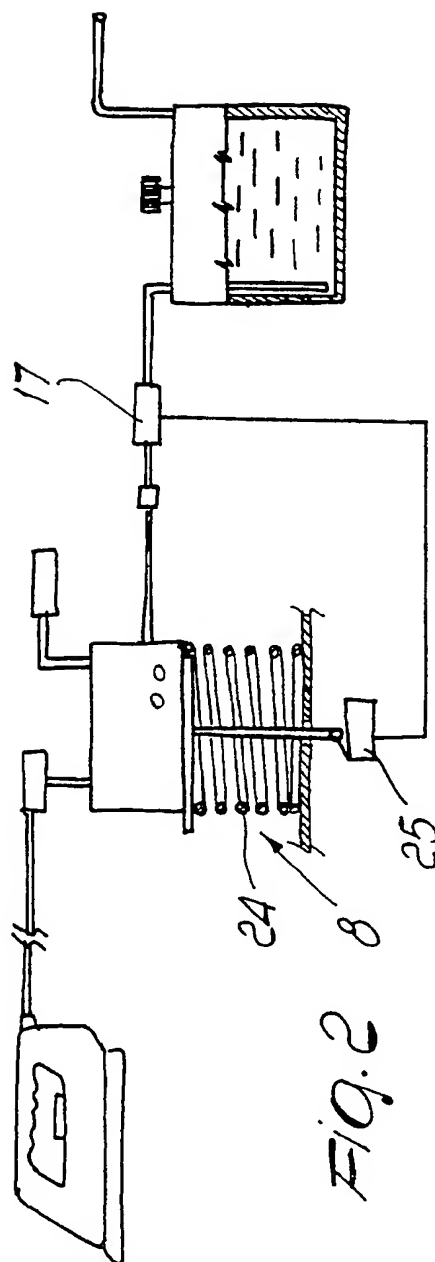
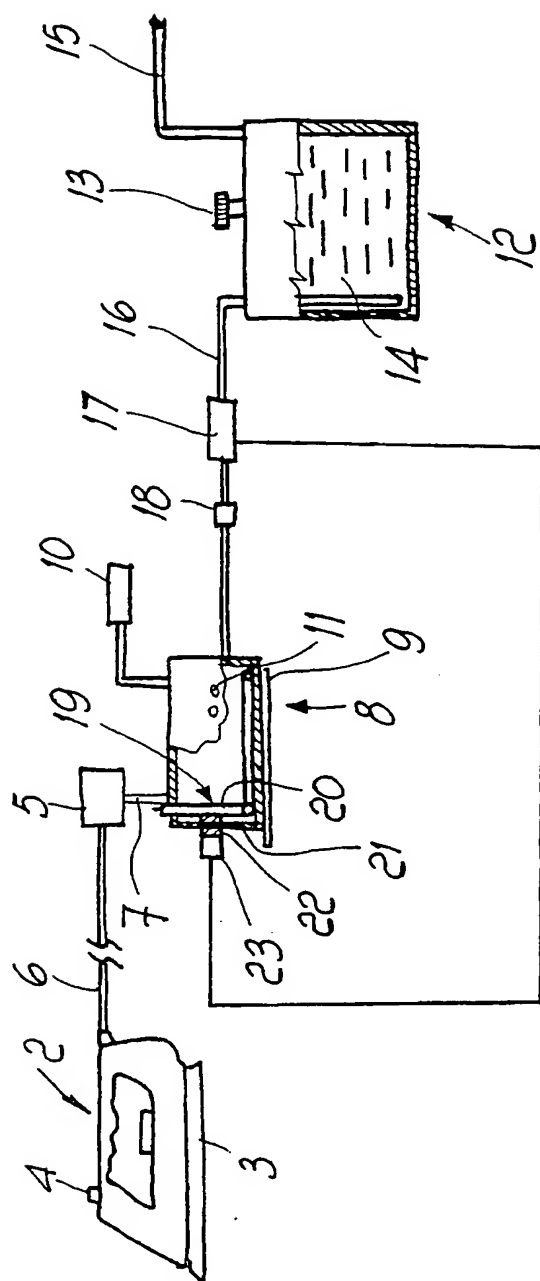
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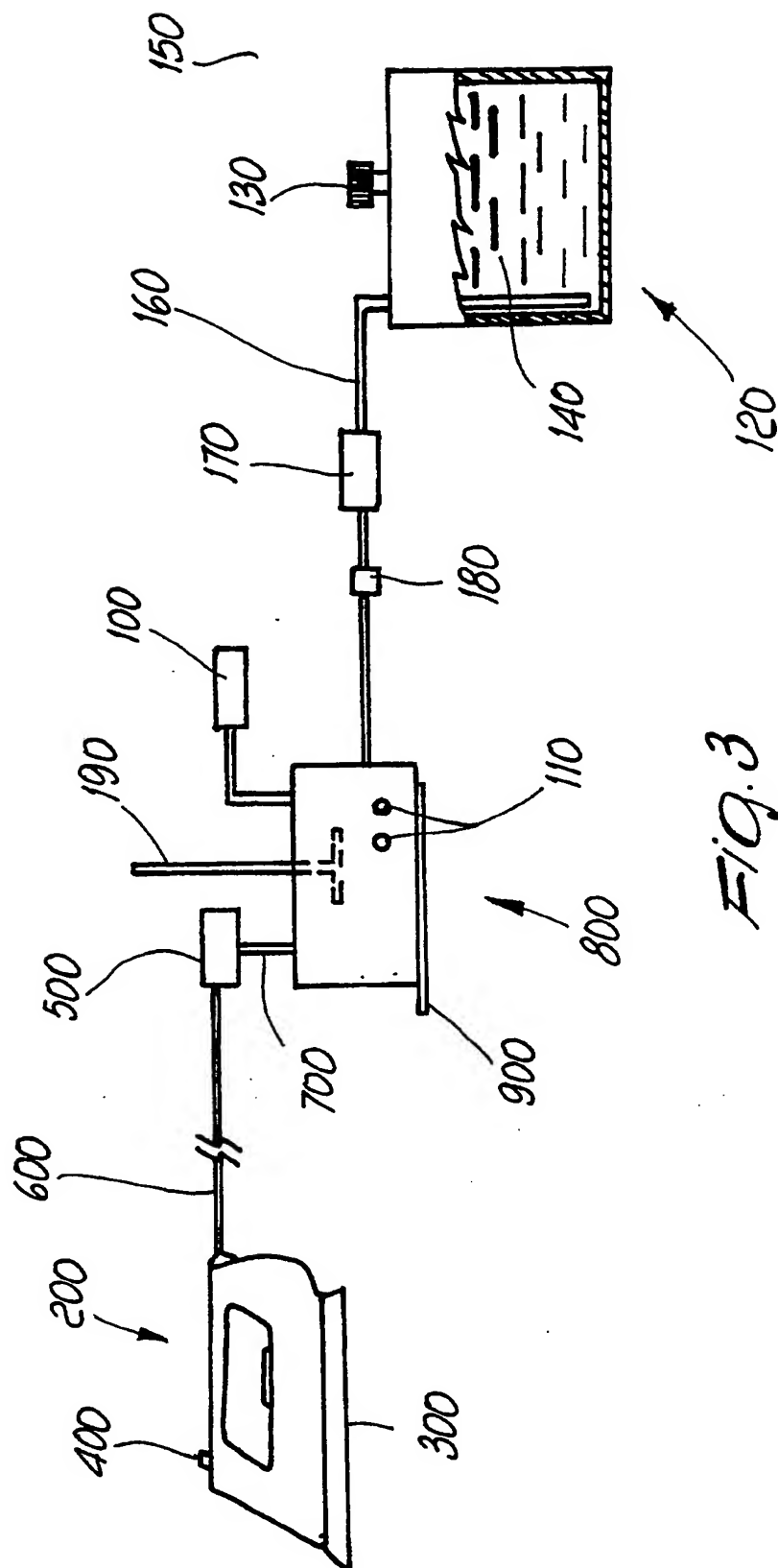


FIG. 3